Amendments to the Specification

Please amend the Brief Description Of The Drawings section at page 4, line 15 through page 7, line 21 in the following manner:

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of the present invention will become more apparent from the following detailed description taken with the accompanying drawings in which:

FIG. 1 is a view showing a toner replenishing system embodying the present invention and including a developing section, a toner container for replenishing toner to the developing section, and toner delivering means connecting the developing section and toner container;

FIG. 2 is a view showing the toner container and toner delivering means more specifically;

FIGS. [[3-1]] 3-A and [[3-2]] 3-B are views showing a nozzle included in the illustrative embodiment;

FIG. 4 is a view showing the toner container and nozzle connected to each other;

FIGS. [[5-1]] 5-A and [[5-2]] 5-B are views each showing a particular modification of the nozzle;

FIG. 6 is a section the toner container and nozzle;

FIG. 7 is a view showing a specific configuration of the toner replenishing system including a suction pump;

FIG. 8 is a section showing the suction pump;

FIG. 9 is a view showing another specific configuration of the toner replenishing system implemented by a combined blow and suction system;

FIGS. [[10-1]] 10-A through [[10-3]] 10-C are views showing specific configurations of a tight contact enhancing mechanism included in the illustrative embodiment;

FIGS. [[11-1]] 11-A through [[11-3]] 11-C are views showing another specific configurations of the tight contact enhancing mechanism;

FIGS. [[12-1]] 12-A and [[12-2]] 12-B are views showing sill another specific configuration of the tight contact enhancing mechanism;

FIGS. [[13-1]] 13-A and [[13-2]] 13-B are views showing a further specific configuration of the tight contact enhancing mechanism;

FIGS. [[14-1]] 14-A through [[14-3]] 14-C are views showing a still further specific configuration of the tight contact enhancing mechanism;

FIGS. [[15-1]] 15-A and [[15-2]] 15-B are views showing the external appearance of the toner container;

FIGS. [[16-1]] 16-A through [[16-3]] 16-C are views showing specific configurations of a mouth forming part of the toner container;

FIG. 17 is a view showing another specific configuration of the mouth;

FIG. 18 is a view showing pressure adjusting means provided on a sack forming another part of the toner container;

FIGS. [[19-1]] 19-A and [[19-2]] 19-B are views showing a modification of the toner container;

FIG. 20 is a view showing another modification of the toner container;

FIGS. [[21-1]] 21-A through [[21-3]] 21-C are views each showing a particular modification of the toner container;

FIG. 22 is a view showing another modification of the toner container;

FIG. 23 is a view showing still another modification of the toner container;

FIG. 24 is a view showing yet another modification of the toner container;

FIGS. [[25-1]] 25-A and [[25-2]] 25-B are views showing a further modification of the toner container;

FIG. 26 is a graph showing a relation between the packing density of the toner container and the degree of cohesion of toner;

FIG. 27 is a graph showing a relation between the shape of the toner container and the degree of cohesion;

FIG. 28 is a view showing a specific method of packing the toner container with toner;

FIG. 29 is a view showing a specific experimental arrangement used in Example 1;

FIG. 30 is a graph showing a relation between the packing density of the toner container and the amount of toner left in the toner container;

FIG. 31 is a view showing a specific experimental arrangement used in Example 2;

FIG. 32 is a graph showing a relation between the packing density of the toner container and the residual amount of toner;

FIG. 33 is a view showing the cubic shape of a toner container used in Examples 3 and 4;

FIG. 34 is a graph showing a relation between the toner container and the residual amount of toner;

FIG. 35 is a graph showing a relation between the residual amount of toner left in a fist sample used in Example 5 and the amount of replenishment for a unit time; and

FIG. 36 is a graph showing a relation between the residual amount of toner left in a second sample used in Example 5 and the amount of replenishment for a unit time.

Please amend the paragraph at page 11, line 19 through page 12, line 4 in the following manner:

FIGS. [[3-1]] 3-A and [[3-2]] 3-B show a specific configuration of the nozzle 11. As shown, the nozzle 11 is a columnar member formed of, e.g., plastics or metal. The nozzle 11 has a tubular toner outlet portion 16 and a tubular air inlet portion 16 extending in the lengthwise direction of the column and each protruding from the opposite ends or the side of the column, as illustrated. A hole or toner outlet 15 is formed in one end of the toner outlet portion 16. The air inlet portion 18 surrounds the toner outlet portion 16. The nozzle 11 has its outermost wall 17 connected to the toner outlet portion or mouth of the toner container 2, not shown, such that the hole 15 is disposed in the container 2, as will be described more specifically later.

Please amend the paragraph at page 12, line 19 through page 13, line 12 in the following manner:

FIG. 4 shows a specific configuration for connecting the toner container 2 to the nozzle 11. The toner container 2, which is a specific form of atoner container applicable to the present invention, will be described in detail later. As shown, a mechanism 26 for

enhancing tight contact (tight contact enhancing mechanism hereinafter) is arranged in the tubular mouth 13 of the toner container 2. While the toner container 2 is positioned upright with the mouth 13 facing downward, one end or tip of the nozzle 11 is inserted in the tight contact enhancing mechanism 26. The mechanism 26 is implemented by a flat elastic member 20 (see FIGS. [[10-1]] 10-A and [[10-2]] 10-B) affixed to the inner periphery of the mouth 13 and great enough to fill up the space inside the mouth 13. The elastic member 20 is formed with slits that will be described later. The elastic member 20 prevents the toner from leaking from the toner container 2 despite the slits. In addition, when the tip of the nozzle 11 is inserted into the toner container 2, the member 20 deforms to insure air-tightness without any gap intervening between the member 20 and the nozzle 11. This is successful to insure toner delivery using the air stream.

Please amend the paragraph at page 13, line 25 through page 14, line 6 in the following manner:

FIGS. [[5-1]] 5-A and [[5-2]] 5-B show a modification of the nozzle of FIGS. [[3-1]] 3-A and [[3-2]] 3-B; identical structural elements are designated by identical reference numerals. As shown, the modified nozzle 11 has the tubular toner outlet portion 16 and tubular air inlet portion 18 separate from and parallel to each other. The inside of the nozzle 11 supporting the two portions 16 and 18 may be hollow or solid, as desired.

Please amend the paragraphs at page 22, lines 6-21 in the following manner:

Referring to FIGS. [[10-1]] 10-A and [[10-2]] 10-B, the elastic member 20 formed with two slits 12 intersecting each other covers the opening of the tubular body, constituting the tight contact enhancing mechanism. Preferably, the slits 12 should intersect each other at an angle .theta. of 90 degrees. In this condition, the elastic member 20 evenly presses the nozzle 11 over the entire circumference of the nozzle 11 and thereby guarantees tight contact. While the number of slits is open to choice, the slits should be spaced by the same angular distance as far as possible.

As shown in FIG. [[10-3]] 10-C, an annular cover 41 having a suitable degree of rigidity may be fitted on the circumferential surface of the elastic member 20. The cover 41 is capable of accommodating the elastic member 20 and has a slightly smaller outside diameter

than the elastic member 20. When the elastic member 20 is fitted in the cover 41, the latter presses the former radially inward and thereby further insures tight contact.

Please amend the paragraph at page 23, lines 6-13 in the following manner:

FIG. [[11-1]] 11-A shows another specific configuration using the elastic member. Tubular bodies shown in FIG. [[11-1]] 11-A have a shoulder C (see FIG. [[16-1]] 16-A) thereinside. The shoulder C forms a toner outlet 13-1. An annular elastic member 31 intervenes between the elastic member, labeled 26, and the toner outlet 13-1 and has a hole 31 extending in the direction in which the nozzle 11 is inserted into and removed from the tubular body. The hole 31-1 has a diameter D1 slightly smaller than the diameter D2 of the nozzle 11.

Please amend the paragraphs at page 23, line 23 through page 25, line 7 in the following manner:

FIG. [[11-2]] 11-B shows another specific configuration in which the toner outlet 13-1 of the toner container 2 has a diameter D3 smaller than the length L of one slit 26-a of the elastic member 26. The elastic member 26 is formed with four slits, as illustrated. When the elastic member 26 is formed with three or more slits 26-a, the slits 26-a are apt to rise and stop, e.g., the hole of the nozzle 11 when the nozzle 11 is inserted into the toner container 2. The diameter D3 smaller than the length L solves this problem.

As shown in FIG. [[11-3]] 11-C, to prevent the slits 26-a from rising, use may be made of a film 32 formed with a hole 32-1 having a diameter D4 smaller than the length L of one slit 26-a. The film 32 is fitted to the elastic member 26 with the center of its hole 32-1 aligning with the center of the toner outlet 13-1. This can be easily done by using a two-sided adhesive tape. The film 32 may be adhered to the entire surface of the-elastic members 26 because the slits 26-a of the upper elastic member 26 and those of the lower elastic member 26 are not coincident except for their centers.

FIGS. [[12-1]] 12-A and [[12-2]] 12-B and FIGS. [[13-1]] 13-A and [[13-2]] 13-B each show another specific configuration of the tight contact enhancing mechanism. As shown, the elastic member 26 is implemented by a packing in the form of a plate or a sheet having any desired width a. The elastic member 26 is affixed to the inner periphery

of the tubular body 13, as shown in FIGS. [[12-1]] 12-A and [[12-2]] 12-B, or to the outer periphery of the same, as shown in FIGS. [[13-1]] 13-A and [[13-2]] 13-B. If desired, a plurality of elastic members 26 may be fitted on the tubular body 13.

FIGS. [[14-1]] 14-A through [[14-3]] 14-C show another specific configuration of the tight contact enhancing mechanism. Usually, the toner out let of the toner container 2 is sealed by some sealing means in order to prevent the toner from leaking. Specifically, in the configuration shown in FIG. [[14-1]] 14-A, a sheet 33 is adhered to the toner outlet of the toner container 2. As shown in FIG. [[14-2]] 14-B, the nozzle 11 is pressed against the sheet 33. As shown in FIG. [[14-3]] 14-C, the nozzle 11 enters the toner container 11 by piercing the sheet 33. As a result, the sheet 33 is sandwiched between the tubular body 13 and the nozzle 11, enhancing tight contact.

Please amend the paragraphs at page 25, line 24 through page 27, line 11 in the following manner:

The toner container of the present invention will be described more specifically with reference to FIGS. [[15-1]] 15-A and [[15-2]] 15-B. As shown, the toner container 2 includes at least a mouth or toner out let portion 50, a bottom 51, and a side wall 52 connecting the mouth 50 and bottom 51. The mouth 50 has a section 50-1 having a maximum diameter smaller than the maximum diameter of the bottom 51 although such a configuration is not limitative. Generally, therefore the side wall 51 has a diameter sequentially decreasing at least in a portion 52-1 adjoining the mouth 50, as illustrated. The shape of the bottom 51 and the cubic shape of the toner container 2 are open to choice so long as they satisfy the above conditions.

The toner container of the present invention may be positioned vertically or horizontally, as desired, because of the toner replenishing system using an air stream. In practice, the vertical position of the container with its mouth facing downward is natural and most effective from the gravity standpoint. To stably discharge the toner with an air stream via the mouth facing downward and to minimize the amount of residual toner to be left in the container, it is effective to incline the smaller diameter portion 52-1 of the side wall 52 relative to the section 50-1 of the mouth or tubular portion 50. This is particularly

desirable when the toner container is soft and easy to slacken. The angle .theta. between the smaller diameter portion 52-1 and the section 50-1 of the mouth 50 should preferably be, but not limited to, about 45 degrees to about 90 degrees, more preferably about 60 degrees to about 90 degrees. In FIG. [[15-1]] 15-A, the angle .theta. of the smaller diameter portion 52-1 is the same at both sides. In [[15-2]] 15-B, a smaller diameter portion 52-2 has an angle .theta.1 of about 90 degrees at one side and an angle .theta.2 smaller than 90 degrees at the other side. It is to be noted that such a smaller diameter portion does not have to be formed over the entire side wall 52.

The soft toner container available with the present invention includes at least a flexible sack or toner storing portion and a rigid mouth or toner outlet portion, as stated earlier. The sack is designated by the reference numeral 2a in FIGS. [[16-1]] 16-A and [[16-3]] 16-C.

Please amend the paragraphs at page 29, line 17 through page 30, line 6 in the following manner:

The mouth or toner outlet portion may be formed of polyethylene, polypropylene or similar plastics or metal. While the mouth is relatively rigid, its material should preferably be identical with or at least similar to the material of the sack in order to facilitate joining. The tubular body constituting the mouth is generally made up of a mating portion capable of mating with, e.g., the nozzle and a fitting portion to be fitted in the opening of the sack. Each of the two portions may have a particular inside diameter and a particular structure in accordance with the function assigned thereto. FIG. [[16-1]] 16-A shows a specific configuration of the mouth including a mating portion A and a fitting portion B. As shown, the mating portion A has an inside diameter x greater than the inside diameter y of the fitting portion B. The tight contact enhancing mechanism stated earlier is provided up to the shoulder C. This structure is similarly applicable to the hard toner container.

Please amend the paragraphs at page 30, line 15 through page 31, line 4 in the following manner:

To fit the fitting portion B of the tubular body to the sack, it is preferable to use, e.g., heat or ultrasonic wave in order to prevent air from leaking from the sack. FIG. [[16-2]] 16-B shows a specific configuration of the fitting portion B for achieving sure fitting. As

shown, the fitting portion B has a ship-like cross-section that is superior to the circular cross-section from the above-stated standpoint.

FIG. [[16-3]] 16-C shows a specific device for allowing the air stream to easily deliver the toner from the toner container. As shown, the open portion of the sack 2a is fitted on the fitting portion B of the mouth. The open portion of the sack 2a includes a portion D having a surface substantially parallel to the surface of the fitting portion B, so that the toner easily gathers at the portion D and can be stably delivered. The portion D has substantially the same length as the fitting portion B although it is open to choice.

Please amend the paragraphs at page 32, line 13 through page 33, line 10 in the following manner:

FIG. [[19-1]] 19-A shows a toner container including a squeezed portion adjoining a portion of the sack 2a connected to the mouth 13. FIG. [[19-2]] 19-B shows a toner container including a plurality of squeezed portions 53 formed in the side of the sack 2a. The or each squeezed portion 53 prevents the weight of the toner above it from being transferred to the mouth 13 and thereby prevents the toner adjoining the mouth 13 from cohering while stopping relatively large masses of toner. Consequently, the toner conduit 12 and toner outlet are prevented from being stopped by the toner.

FIG. 20 shows an envelope-like toner container implemented by two flexible materials having substantially the same shape. The two flexible materials are connected by heat seating except for the end for forming the toner outlet, and then the mouth is fitted in the toner outlet. As shown in FIG. [[21-1]] 21-A or [[21-2]] 21-B, a hanging portion 56 formed with a hole 55 may be formed at the bottom of the envelope-like sack 2a. Alternatively, as shown in FIG. [[21-3]] 21-C, a knob 57 may be formed on the side of the sack 2a. The toner container shown in FIG. [[21-1]] 21-A or [[21-2]] 21-B may be mounted to the apparatus body with the hanging portion 56 or the knob 57 held by hand. This prevents the flexible toner container 2 from falling down when the amount of toner remaining therein is short. In addition, the hanging portion 56 or the knob 57 facilitates the conveyance of the toner container 2 packed with toner.

Please amend the paragraphs at page 33, line 23 through page 35, line 4 in the following manner:

FIGS. [[25-1]] 25-A and [[25-2]] 25-B show a modified toner container 40 similar to the toner container of FIG. [[15-2]] 15-B. As shown, the toner container 40 has a sack provided with a rectangular bottom. One or two sides of the sack are inclined by an angle of less than 90 degrees relative to the section of the tubular body. The toner container 40 with this configuration has desirable volume efficiency.

When an image forming apparatus repeats image formation with the soft toner container set therein, the toner container deforms due to the consumption of the toner and is apt to fail to fully discharge the toner. To solve this problem, the present invention uses means for allowing the toner container to preserve its original position as far as possible (position preserving means hereinafter). Specifically, the toner container 40 shown in FIG. [[25-1]] 25-A includes position preserving means 48 surrounding a sack 49. The position preserving means 48 may be formed of relatively hard plastics, paper or a combination thereof and may have any desired shape and structure so long as it can achieve the expected function.

While the position preserving means 48 shown in FIG. [[25-1]] 25-A has a box-like configuration surrounding the sack 49, such a configuration is only illustrative. FIG. [[25-2]] 25-B shows a modification of the position preserving means having six surfaces. As shown, the surfaces of the position preserving means 48 except for the surface, labeled a, for supporting the mouth are holed except for their edge portions.

If desired, the position preserving means may be implemented as a sack filled with air. Also, the position preserving means may be arranged in the apparatus in such a manner as to support the flange shown in FIG. 17, the hanging portion shown in FIG. [[21-1]] 21-A or [[21-2]] 21-B or the knob 57 shown in FIG. [[21-3]] 21-C. Further, the position preserving means may be implemented as an adhering member fitted on a suitable position of the sack and adhered to a preselected portion of the apparatus.

Please amend the paragraph at page 45, lines 3-15 in the following manner:

FIG. 29 shows a specific arrangement for executing Example 1. As shown, the arrangement includes the nozzle 11 shown in FIGS. [[3-1]] 3-A and [[3-2]] 3-B. The toner outlet portion 16 of the nozzle 11 has an inside diameter of 6 mm and a thickness of 0.5 mm.

The air inlet portion 18 is spaced from the toner outlet portion 16 by a gap of 1 mm and has a thickness of 0.5 mm and an outside diameter of 9 mm. The toner conduit 12 is formed of EPDM to be flexibly deformable and provided with an inside diameter of 7 mm. The toner conduit 12 is air-tightly connected to the end of the toner outlet portion 16. The toner conduit 12 is 1,000 mm long and provided with a difference in level or height of 300 mm between its opposite ends. The other end of the toner conduit 12 is fixed in place above a beaker 66 set on an electronic balance 65 (FA-2000 (trade name) available from A & D).